WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a semiconductor substrate;

a flexible area isolated from said semiconductor substrate and displaced in response to temperature change, and

a thermal isolation area placed between said semiconductor substrate and said flexible area and made of a resin for joining said semiconductor substrate and said flexible area.

2. The semiconductor device as claimed in claim 1, wherein the material of which said thermal isolation area is made has a thermal conductivity coefficient of about 0.4 W/(m °C) or less.

3. The semiconductor device as claimed in claim 1, wherein the material of which said thermal isolation area is made is polyimide.

4. The semiconductor device as claimed in claim 1, wherein the material of which said thermal isolation area is made is a fluoridated resin.

5. The semiconductor device as claimed in claim 1, wherein a reinforcement layer made of a harder material than the material of which said thermal isolation area is made is provided on at least one face orthogonal to a thickness direction of said thermal isolation area.

6. The semiconductor device as claimed in claim 1, wherein the reinforcement layer has a Young's modulus of 9.8×10^{9} N/m^{2} or more.

7. The semiconductor device as claimed in claim 1, wherein the reinforcement layer is a silicon dioxide thin film.

8. The semiconductor device as claimed in claim 1, wherein portions of said semiconductor substrate and said flexible area in contact with said thermal isolation area form comb teeth.

9. A semiconductor device comprising:

a semiconductor substrate;

a flexible area isolated from said semiconductor substrate and displaced in response to temperature change;

a thermal isolation area placed between said semiconductor substrate and said flexible area and made of a resin for joining said semiconductor substrate and said flexible area; and

a moving element placed contiguous with the flexible area, said moving element being displaced relative to the semiconductor substrate when temperature of the flexible area changes.

10. The semiconductor device as claimed in claim 9, wherein the flexible area has a cantilever structure.

11. The semiconductor device as claimed in claim 9, wherein said moving element is supported by a plurality of flexible areas.

12. The semiconductor device as claimed in claim 11, wherein the flexible areas are in the shape of a cross with said moving element at the center.

13. The semiconductor device as claimed in claim 11, wherein displacement of said moving element contains displacement rotating in a horizontal direction to a substrate face of the semiconductor substrate.

14. The semiconductor device as claimed in claim 11, wherein the flexible areas are four flexible areas each shaped in L, the four flexible areas being placed at equal intervals in every direction with said moving element at the center.

15. The semiconductor device as claimed in claim 9, wherein the flexible area is made up of at least two areas having different thermal expansion coefficients and is displaced in response to a difference between the thermal expansion coefficients.

16. The semiconductor device as claimed in claim 15, wherein the flexible area includes an area made of silicon and an area made of aluminum.

17. The semiconductor device as claimed in claim 15, wherein the flexible area includes an area made of silicon and an area made of nickel.

18. The semiconductor device as claimed in claim 15, wherein at least one of the areas making up the flexible area is made of the same material as the thermal isolation area.

19. The semiconductor device as claimed in claim 18, wherein the flexible area includes an area made of silicon and an area made of polyimide as the area made of the same material as the thermal isolation area.

20. The semiconductor device as claimed in claim 18, wherein the flexible area includes an area made of silicon and an area made of a fluoridated resin as the area made of the same material as the thermal isolation area.

21. The semiconductor device as claimed in claim 9, wherein the flexible area is made of a shape memory alloy.

22. The semiconductor device as claimed in claim 9, wherein a thermal insulation area made of a resin for joining the flexible area and said moving element is provided between the flexible area and said moving element.

23. The semiconductor device as claimed in claim 22, wherein rigidity of the thermal isolation area provided between the semiconductor substrate and the flexible area is made different from that of the thermal isolation area provided between the flexible area and said moving element.

24. The semiconductor device as claimed in claim 9, wherein the flexible area contains heat means for heating the flexible area.

25. The semiconductor device as claimed in claim 9 further comprising:

wiring for supplying power to the heat means for heating the flexible area is formed without the intervention of the thermal isolation area.

26. A semiconductor microvalve comprising:

a semiconductor substrate;

a flexible area isolated from said semiconductor substrate and displaced in response to temperature change;

a thermal isolation area placed between said semiconductor substrate and said flexible area and made of a resin for joining said semiconductor substrate and said flexible area; and

a moving element placed contiguous with the flexible area, said moving element being displaced relative to the semiconductor substrate when temperature of the flexible area changes; and

a fluid element being joined to said semiconductor device and having a flow passage with a flowing fluid quantity changing in response to displacement of the moving element.

27. The semiconductor microvalve as claimed in claim 26, wherein said semiconductor device and said fluid element are joined via a spacer layer.

28. A semiconductor microrelay comprising:

a semiconductor substrate;

a flexible area isolated from said semiconductor substrate and displaced in response to temperature change;

a thermal isolation area placed between said semiconductor substrate and said flexible area and made of a resin for joining said semiconductor substrate and said flexible area; and

a moving element placed contiguous with the flexible area, said moving element being displaced relative to the semiconductor substrate when temperature of the flexible area changes; and

a fixed element joined to said semiconductor device and having fixed contacts being placed at positions corresponding to a moving contact provided on the moving element, the fixed contacts being able to come in contact with the moving contact.

29. The semiconductor microrelay as claimed in claim 28, wherein the fixed contacts are placed away from each other and come in

contact with the moving contact, whereby they are brought into conduction via the moving contact.

30. The semiconductor microrelay as claimed in claim 28, wherein said semiconductor device and said fixed element are joined via a spacer layer.

31. A manufacturing method of a semiconductor device as claimed in claim 18 prepared by a process comprising the steps of:

etching and removing one face of the semiconductor substrate to form a bottom face part as one area forming a part of the flexible area;

etching and removing the other face of the semiconductor substrate to form the concave part in the moving element;

etching and removing the other face of the semiconductor substrate to form at least a portion which becomes the thermal isolation area placed between the semiconductor substrate and the flexible area;

filling the portion which becomes the thermal area with a thermal insulation material to form the thermal insulation area; and

applying a coat of the thermal insulation material to the one face of the semiconductor substrate to form one area forming a part of the flexible area.

32. A manufacturing method of a semiconductor device as claimed in claim 16 prepared by a process comprising the steps of:

etching and removing one face of the semiconductor substrate to form a bottom face part as one area forming a part of the flexible area;

etching and removing the other face of the semiconductor substrate to form the concave part in the moving element;

etching and removing the other face of the semiconductor substrate to form at least a portion which becomes the thermal isolation area placed between the semiconductor substrate and the flexible area;

forming an aluminum thin film as an area defined in the flexible area on the other face of the semiconductor substrate and a wire for applying an electric power to the heating means;

filling the portion which becomes the thermal area with a thermal insulation material to form the thermal area.

33. A manufacturing method of a semiconductor device as claimed in claim 17 prepared by a process comprising the steps of:

etching and removing one face of the semiconductor substrate to form a bottom face part as one area forming a part of the flexible area;

etching and removing the other face of the semiconductor substrate to form the concave part in the moving element;

etching and removing the other face of the semiconductor substrate to form at least a portion which becomes the thermal isolation area placed between the semiconductor substrate and the flexible area;

forming a wire for applying an electric power to the heating means;

filling the portion which becomes the thermal area with a thermal insulation material to form the thermal area; and

forming a nickel thin film as an area defined in the flexible area on the other face of the semiconductor substrate.

34. A manufacturing method of a semiconductor device as claimed in claim 1 prepared by a process comprising the steps of:

etching and removing one face of the semiconductor substrate to form at least a portion which becomes the thermal isolation area placed between the semiconductor substrate and the flexible area;

filling the portion which becomes the thermal isolation area with a thermal insulation material to form the thermal isolation area; and

etching and removing the other face of the semiconductor substrate to form the thermal insulation area.

35. A manufacturing method of a semiconductor device as claimed

in claim 5 prepared by a process comprising the steps of:

etching and removing one face of the semiconductor substrate to form at least a portion which becomes the thermal insulation area placed between the semiconductor substrate and the flexible area;

forming a reinforce layer in the thermal insulation area;

filling the portion which becomes the thermal isolation area with a thermal insulation material to form the thermal isolation area; and

etching and removing the other face of the semiconductor substrate to form the thermal isolation area.